MUSEUM STORIES FOR CHILDREN

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SERIES IX
NUMBER ONE
OCTOBER 6, 1928

72803

FIELD MUSEUM OF NATURAL HISTORY
ROOSEVELT ROAD AND LAKE MICHIGAN
CHICAGO

FIELD MUSEUM OF NATURAL HISTORY

Field Museum welcomes you to the autumn entertainments, given under the provisions of the Raymond Fund, and hopes that you will enjoy and benefit by the series.

STEPHEN C. SIMMS, *Director*

SKY CHILDREN

Did you ever try to count the sky's children—those nebulae, stars and planets which make the great, blue spaces above us so brilliant on a clear, cold, wintry night?

The astronomers, the people who study the heavens and all the things there, tell us that we may see five thousand without the aid of a telescope, and that this number is but a handful compared to the vast numbers shown by photographs of the entire sky taken through a large telescope in an observatory.

Some are so small and so far away that they appear as mere wisps of vapor floating in the air; some are much nearer and hang like lanterns against a blue ceiling, while others like our own Sun, are near enough for us to feel the heat produced as the light given off by the gases passes through the restless air about our own planet.

What fun to watch a fire! First the coal or wood gives off gases, then bursts into flame. As we look we see that the flame changes from white to red, and then dies down completely. A somewhat similar change takes place among the stars.

Whirling, swinging masses of gas which are moving through space form a Nebula. If we were able to follow its movements for a long, long time we might see some of the greenish-white curls twist about each other and other curls join those. For in some such way a baby star is formed. It has a thicker mass than the rest of the nebula and gradually pulls other loose particles to itself. Then its light becomes bright and we say, "See how that star sparkles!" The twinkle is due to the fact that the vibration of the atmosphere breaks up the light and makes it oscillate or sparkle.

When a star is at its hottest stage it is bluish-white. Then its intensity begins to lessen and it glows with a steady, golden-yellow color. Our own Sun is at this stage now. The swirling of its carbon, hydrogen, calcium, magnesium and iron gases causes great tongues of flame to extend out from the star. From these come the warm rays of light and heat which make it possible for us to live on the Earth. Do you know that it takes that light about eight minutes to travel from the Sun to the Earth?

If you see a star with the colors of orange-red or red, that star is beginning to get old. Little by little the light will become fainter until the star is dark, or a planet. Just as our Earth and her six sister-planets revolve about the Sun, so those dark masses continue to turn about some other strong central star rushing on out there in space, unlighted except as they reflect the light of other stars.

The power of pulling in stray bits of material, in time, results in a mass large enough to attract and hold gases such as carbon-dioxide, nitrogen and water-vapor.

This is a very important step in the building of a land on which plants and people are to live. The gases form an atmosphere, that all-enclosing envelope of air that surrounds the Earth. The water-vapor changes into rain, which tumbles down the sides of the great volcanic masses cutting deep valleys and filling in the hollows. Soon the crust is covered with soil, the warm rays of a sun shine upon the surface and the planet becomes a beautiful land.

We think our Sun an immense body. So it is when compared with objects about us, but to an observer on some other planet revolving about some other sun, our Sun would appear as a tiny point of light only, for there are thousands of stars larger and more brilliant.

Look out a window that faces to the south on some clear, cold night. The most noticeable feature will be the constellation known as "Orion." Of all star groups, this is the largest, the most interesting, and the most beautiful. It may be seen by boys and girls in every part of the Earth.

Orion, according to the Grecian legend, was a famous hunter whose death was caused by the sting of a scorpion. After death both giant and scorpion were placed in the sky. To find this mighty giant, look, first, for three bright stars in a straight line, each star equally distant from the other. This is Orion's Belt. To the right is Betelgeuse on the giant's shoulder. It is a famous orange-red star. The bright blue star in the left ankle is called "Rigel" and is the brightest star in the group. Hanging from the right side of the Belt is his sword. This contains the Great Nebula, which is bat-shaped and the most marvelous thing of its kind in our sky.

To the left of the slanting Belt is Sirius in the mouth of Canis Major, the hunter's favorite dog. Sirius is bright blue. Who has not noticed this great, twinkling mass of light? It is so near, so friendly, and so brilliant, and gives thirty times, as much light as our Sun.

Other noted groups to be observed in the winter sky are Leo, the lion, crouching in the east; the Great Bear or Big Dipper treading in a circle around the North Star, and the Heavenly Twins in the Milky Way. All are children of the sky. MARGARET M. CORNELL, Guide-lecturer

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OCTOBER 13, 1928

FIELD MUSEUM OF NATURAL HISTORY

ROOSEVELT ROAD AND LAKE MICHIGAN
CHICAGO

FIELD MUSEUM OF NATURAL HISTORY

Several beautiful cecropia moths and some monarch butterflies can be found at the west end of William V. Kelley Hall (Hall 17). Try to find the difference between butterflies and moths.

STEPHEN C. SIMMS, *Director*

BUTTERFLIES AND MOTHS

This is the time of year when the wild creatures prepare for winter. Cold weather is particularly hard for such small and delicate living things as butterflies and moths, and many of them die. Others tuck themselves away in snug hiding places to sleep all winter. But the monarch, a large and beautiful butterfly, and one of the commonest in our part of the world, follows the example of the birds which fly south. In the country we sometimes see swarms of thousands of monarchs, all flying high and steadily southward, resting only at night, when they settle, usually, on trees. In Florida and other warm southern states these travelers live the rest of their short lives, and there they lay eggs from which develop new butterflies to come to us next summer.

The monarch is often called milkweed butterfly, after its favorite plant. The mother monarch lays her eggs, one at a time, on leaves of the milkweed, or occasionally on the flower. If you should ever find one of the tiny pale green eggs, look at it through a magnifying glass. After four or five days the little caterpillar, or larva, eats its way out of the egg, and at once eats all of the shell. Then it begins on the leaf or flower. The larva is very tiny, but it eats so much and grows so fast that its skin is soon much too tight, and splits along the back. The larva crawls out of it much as you might crawl out of a suit of pajamas. But it does something you wouldn't do—it eats the old suit. A new skin, formed under the old one, takes its place, and before many days is in its turn too small.

After about two weeks of life the larva has changed its skin three or four times, and is full grown. It is nearly two inches long, fat, and greenish yellow or bright yellow striped with black, with a few black projections like stiff hairs at each end. The body is made up of thirteen rings, or segments. On each of the first three is a pair of legs, the six legs which the insect will keep all its life. But to carry the middle and end of its long body the larva has five more pairs of legs, called the prolegs.

When the full grown larva is ready to turn into a pupa, or chrysalis, it finds a sheltered spot on the under side of a branch or rock, and there for the last time sheds the caterpillar skin, coming out shorter and fatter. The new skin of the chrysalis is pale green in color, with small bead-like golden spots. Inside this the pupa hangs head down for about twelve days, while many changes take place. The body becomes shorter and slimmer; the prolegs disappear, and the wings develop. The strong jaws, for eating leaves, give place to a long sucking proboscis, which the butterfly will carry curled like a watch spring when not using it.

When all the changes are complete the chrysalis covering bursts, and soft, limp, damp creature crawls out. It clings with its feet to a twig or stone for some hours, while the wings, which at first look like crumpled brown leaves, gradually unfold and enlarge. At last they are fully smoothed out, three or four inches across, and show a beautiful design of reddish brown edged and veined with black, with whitish spots near the tips. The new body, silky black, moves up and down as the insect breathes, not through a nose, as we do, but through pores in its sides. Finally, when the whole body has dried and rested, and the new wings are strong enough to lift it, the butterfly rises and flies.

Can you tell the difference between butterflies and moths? They are closely related, and there are many kinds of each, large and small, dull and brightly colored. One way to tell is by the antennae, sometimes called feelers. Butterflies have long slender antennae with a knob at the end. Moths have different sorts of antennae, but they do not have the knobbed kind. Some of them are slender and pointed, some fatter and also pointed, some like hairs, and some like tiny feathers. Butterflies usually hold their wings together over their backs when they alight, while moths usually spread theirs flat. Many moths have bright red or yellow hind wings, which they hide under their gray or brown fore wings when at rest. There are moths which have clear wings and fat hairy bodies, and look much like bees. Many moths form chrysalids, like butterflies, and some of them pass the winter buried under ground in pupa form. Others spin a warm silky cocoon. You may have found the reddish brown cocoon of the beautiful cecropia, which is the largest of our common moths. It is often nearly six inches from tip to tip of its velvety wings.

JUNE WORK, Guide-lecturer

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FIELD MUSEUM OF NATURAL HISTORY

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FIELD MUSEUM OF NATURAL HISTORY

A honey bee, taking nectar from a milkweed flower, can be seen toward the center of Hall 29. Look for the enlarged reproduction of the bee's leg, with its pollen sac, shown in the same case.

STEPHEN C. SIMMS, *Director*

ANTS

Ants spend their early life hidden underground or in mounds constructed by the workers of the community. Long before the baby ants are able to walk, they are divided into classes according to their age and size. Their nurses feed them, wash them and carry them about until they are able to take care of themselves.

Ants begin life as small, whitish eggs. About a month after the eggs are laid, they hatch into soft, white grubs called larvae. The body of the ant larva is shaped like a cone, with the head at the narrow end. The larva has no legs and must be carried like a baby. Larvae eat a great deal and grow rapidly for several months. Then suddenly they stop eating. They do not grow any more in size and weight after they cease to eat; but they begin to develop legs, antennae and all other parts of a perfect ant body.

At this time many ant larvae spin silken cocoons around their soft white bodies; and thus become pupae. Strange to say, some larvae become pupae without spinning cocoons. These develop into perfect ants underneath their naked skins, without additional protection. For several days the pupa stays quietly in its cocoon or in its cover of skin. It does not eat; and it does not grow any larger or heavier. In fact, it seems to be asleep. During these days the pupa changes completely from a legless grub to a perfect insect.

A young ant is as helpless as a baby when it first wriggles out of its cocoon. All three pairs of legs are pressed close to the body. Often the ant nurse must unfold each leg before the young insect seems to realize that it has any legs at all. The nurse washes and pets it with her long slender antennae or feelers. Very soon the youngster begins to run about the nest; but it does not venture far for several days. Until its skin hardens, it stays at home and helps take care of the younger ant babies.

When their skin is hard, like a suit of armor, some of the young ants join the "old soldier" ants and help defend the nest. They have very strong jaws. When they bite, they hang on to the antennae or the head of an enemy and refuse to loose their hold. Ant guards usually quarrel with stranger ants.

Some ants act as feeders for the whole community. These insects seem to be very greedy, indeed. They eat until their bodies swell and bulge. When they return to the nest they open their mouths and feed all the stay-at-homes, including the larvae. Ants get some food for their babies from insects which give a honey-like juice from their tiny bodies. These little creatures are aphids,—a kind of plant lice. When an ant finds an aphid feeding on the green leaves of a plant, she strokes it with her antennae until it gives honey. The aphid is known as the ant's cow; and the ants are said to milk it and put it out to pasture. Ants take as good care of their "cows" as they do of their own children.

BEES

Every honey bee has at least a thousand sisters, all living in the same household. Each one might be called a princess, since all of them are children of the queen bee. A few hundred drones, or lazy brothers, enjoy the benefits of the bee hive for a part of the year. One of them becomes the mate of the new queen and flies away with her on a short honeymoon. Soon after the queen returns from her marriage flight she lays a number of small whitish eggs in longitudinal, six-sided cells built by the worker bees. In three days the eggs hatch into legless grubs, called larvae. Each tiny larva lies curled at the bottom of its cell, waiting for its nurse to bring food. Since the queen bee forgets all about her children as soon as the eggs are laid, the worker bees are obliged to play nurse to the growing larvae.

Newly hatched larvae are fed a sort of bee milk, predigested by their nurses. This special "bee jelly" makes the little grubs strong and healthy. After a couple of days the nurse bees bring their small charges pollen and honey obtained from other cells which form a sort of community storehouse. For several days the larvae enjoy a mixed diet of bee jelly, pollen and honey. Each fat grub soon fills more than half its cell. Then the nurses put a ball of "bee bread" (mixed pollen and honey) into each cell; and shut each door with a thin layer of wax.

The larva feeds itself for a day or two on the ball of bee bread; and soon grows so fat that it fills the entire cell. Then it stops eating and goes to sleep. It does not stir for almost two weeks. It has become a pupa or chrysalis. Underneath the hardened skin of the larva, the insect gradually changes from worm-like grub to fully developed bee. When the metamorphosis or change is complete, the young bee bites off the lid of its cell and crawls out into the hive. It soon learns to take its part in the life of the community.

MARGARET F. PYATT, Guide-lecturer

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You can find a very large starfish and many smaller ones, as well as some models of sea anemones in William V. Kelley Hall (Hall 17). Count the arms on the large starfish.

STEPHEN C. SIMMS, *Director*

SEA ANIMALS MINUS BACK-BONES

If all the sea animals with back-bones could be put at the right and all those without back-bones at the left,—where would you put the fishes? Almost all of the fishes would be placed at the right, of course. And where would you put the sponges? Some of them have a skeleton, but not one of them has a back-bone. Zoologists,—that is, people who study and write about animal life,—place all the back-boned animals in one class and call them vertebrates. They place all the spineless creatures in another class and call them invertebrates.

Millions of invertebrates live in the sea. Some of them have shells, such as the oyster, the crab and the lobster. Some become hard and stony after a time, such as the coral and the starfish. Others remain rather soft during their entire life time, such as the jelly fish, the sponge and the sea anemone.

The beautiful sea anemone is an animal which borrowed its name from a plant. It resembles the lovely anemone flower of the woods in its delicate shades of color and in its general shape, with the fringe at the top. The body of the sea anemone is shaped somewhat like a spool of thread standing upright, with the hole in the center forming a large stomach. The creature seems to be almost all stomach. Perhaps that is why it is so often hungry. It usually hides in the mud of the sea bottom until some sea creature, which is good to eat, swims by. Then up comes the body of the sea anemone like a jumping jack. Suddenly a fringe of arm-like processes called "tentacles," which surround the entrance to the stomach, reach out and grab the "food." Sometimes the small fish and other sea creatures which serve as food to the sea anemone are stung to death by its tentacles before they reach the stomach of that hungry invertebrate.

The sea anemone has no legs. Although the creature usually remains fixed to the bottom, it can move from place to place by means of a suction pad which forms the base of the body. When it changes location, the sea anemone settles where strong currents of water pass over it, bringing new supplies of food. Sometimes the sea anemone gets a free ride by attaching itself to the back of a crab. The crab travels along without seeming to notice its burden and the sea anemone reaches for food as it rides comfortably along.

Like the sea anemone, the starfish has a borrowed name. Its body has the shape of a pictured star and it lives in the water as fishes do. Of course it isn't a star; and it isn't even a fish; for it has no back-bone. Perhaps you always thought that a living starfish was as hard or as brittle as the dead ones you pick up along the sea shore. A living starfish is almost as soft as some sponges. It has a kind of skeleton, to be sure; but its whole body bends easily in almost any direction as it moves rapidly through the water. A starfish is so flexible that it can squeeze through a crack between rocks.

Most starfishes have five "arms" or more; and some have as many as forty. A groove or depression extends along the center on the under side of each arm. When the starfish "walks" the soft tube-like feet bulge out from inside the grooves. The feet are suckers which cling firmly to the road on which the creature travels.

Starfishes have big appetites. When one of them finds a bed of oysters, a feast is almost sure to follow. Perhaps you wonder how the starfish can manage to pry open the oyster's shell. A hungry starfish fastens itself firmly by its sucker feet to both shells and then proceeds slowly to straighten out its arms. The constant pull of the arms on the shell, in opposite directions, tires out the muscle which holds the oyster shells together, and the oyster gapes open. Then the mouth of the starfish, which is in the very center of its body, reaches for the soft oyster and eats it all up.

Men who raise oysters for the market discover that it does not pay to cut up the starfish which attempt to rob them of their oysters. The hungry creatures must be killed by depriving them of water rather than by chopping off their arms. Starfishes have the strange power of developing new arms in place of the missing ones. The creature grows new parts so easily that if only one arm and a portion of the body remains, an almost perfect starfish may develop. When a few starfishes are punished for eating oysters by being cut up and thrown overboard, a whole school of starfishes may result. Thus the oyster men may multiply the enemy and subtract from their supply of oysters.

The starfish, the sea anemone and the oyster are only a few of the many sea animals which do not possess a back-bone. All of them are invertebrates. See how many others you can name.

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STEPHEN C. SIMMS, *Director*

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FIELD MUSEUM OF NATURAL HISTORY

You will find some frogs, a toad, and a pretty damsel-fly, a near relative of the dragon-flies, in Albert W. Harris Hall (Hall 18). Can you see any difference between the frogs and the toads?

STEPHEN C. SIMMS, *Director*

BOATS IN CHINA

There are said to be more boats in China than in all the rest of the world, and if you were in a southern Chinese city, looking out over the surface of one of the canals that often take the place of streets, you might easily believe it. There are so many rivers and canals in the south of China that people travel on them more than on roads, even in the country. In the cities there is almost every imaginable kind of boat. There are restaurant boats in which people can get their meals. There are boat hotels, called bed boats in Chinese, in which travelers can spend the night. There are boats in which show people live, and in which they give their plays and shows. There are floating temples with priests in them. There are beggars going about in boats to beg from the other boat people. Of course there are many fishermen's boats.

Poor people who have no land on which to build their little houses, often have house boats to live in, and spend almost their whole lives on the water. Many of them are fishermen, and many raise ducks, which do not need much feeding, because they can be set free to find their own dinners among the fish and frogs of the river.

There are little children running about the decks of most of the house boats. You would expect that sometimes a child would fall into the water, and you would be right. That is why the mothers often either tie a child to the boat with a long rope so that he can easily be pulled out, or else fasten a big float or life preserver to his back, so that he will float until he can be fished out.

People who live on the shore sometimes make fun of the boat-dwelling women, and call them "water fowl," but the boat women are generally stronger and healthier than the shore women after all, even though they do have very little to eat and very much hard work. On the whole, the boat people seem to enjoy life, and like most Chinese, they are usually cheerful, and love a joke. Every once in a while they have a holiday or celebration, when they hang out paper lanterns and shoot firecrackers. They have a particularly joyous feast whenever there is a wedding or a new baby is born.

DOWN AT OUR POND

A pond is not very big—perhaps no more than a few yards across, and very often only three or four feet deep. Its bottom usually is green with water plants, some of which grow up above the surface of the water. Often there are clouds of mosquitoes flying over it, and among them are usually dragon-flies. Some children are afraid of these big, long-bodied insects, but they cannot possibly hurt you. It is true that if you should catch one in your hand it might pinch you a little with its strong mouth parts, but that would do you no real harm. The dragon-fly is our friend, for it catches mosquitoes and flies, and eats them with those strong mouth parts, holding them meanwhile with its legs.

Some mosquitoes come to the pond to lay their eggs, glued together in a little raft, on the surface of the water. If no hungry creature finds and eats them, they soon hatch into squirming legless grubs called wrigglers. Though they live in the water they must breathe air, and the queer thing is that they breathe it through the hind end of the body. You may see them, seemingly hanging by their tails from the surface of the water. They make very good food for fish and frogs and for young dragon-flies, which also live in the water. But in spite of all their enemies, many of them live to grow up. They shed their skins and become pupae, which in three or four days again shed their skins and fly away as full-grown mosquitoes.

The mother frog or toad lays her eggs in a jelly-like mass or in long strings under the water. The babies hatch out without legs, looking as if they were all head and tail. They swim about and catch and eat many tiny bits of food. If they escape being eaten themselves, they change greatly as they grow. First, hind legs develop on each side of the tail. Then fore legs like arms appear. The mouth grows much wider and the eyes become more conspicuous. Meanwhile the tail grows smaller and shorter, and at last it disappears altogether, while inside the tadpole, as the baby is called, other changes have taken place, so that he can no longer breathe under water, but is fitted to go about on land. If he is a frog, however, he is likely to spend much of his time in or near the water, and in spring you can usually hear the chorus of singing frogs whenever you are near a pond.

JUNE WORK, Guide-lecturer

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STEPHEN C. SIMMS, *Director*

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FIELD MUSEUM OF NATURAL HISTORY

In Hall 21 are many hawks and owls, including those mentioned in the story. Perhaps you can see how all of them are especially fitted for the work they do.

STEPHEN C. SIMMS, *Director*

SOME HAWKS AND OWLS.

When you are in the country next time, perhaps you will see a large bird with long slender wings, flying slowly over a meadow or swamp. You may recognize it as a marsh hawk by the large white patch at the upper base of the tail. Some people call it a chicken hawk, but it seldom takes chickens, and usually eats mice, small rabbits, gophers and other small animals that would injure the farmer's crops. The marsh hawk also catches many grasshoppers and other injurious insects.

Other useful large hawks, which you may know by their names, are the red-tailed, the red-shouldered, and the rough-legged. The last has feathers right down to its toes. All these birds can be seen flying low over open country, in search of the small animals and insects which they eat.

Sometimes, too, you will see a slender little reddish-brown hawk perched on a telephone wire or dead branch, watching for a chance to swoop down on a mouse or grasshopper. Being little larger than a robin, the sparrow hawk lives largely upon insects.

It is true that there are hawks which live largely upon birds, and which might fairly be called chicken hawks. They are not as well known because they do not show themselves as much as those which live on meadow animals and insects. The slender, swift, sharp-shinned hawk, not much larger than the sparrow hawk, and the Cooper's hawk, much like the sharp-shinned, but larger, are the most important of these bird-eaters, and it is probable that they do more harm than good. When the slow-flying marsh hawk soars over the farmyard, the chickens squawk and run for shelter, but they do not see the sharp-shinned hawk coming. He swoops suddenly from behind a tree, and perhaps there is a chicken missing when he is gone. Or perhaps it was a robin, or a pigeon, that did not see the danger until too late.

Most farmers feel that they must have cats in their barns, to keep the mice and rats from getting too plentiful. But the lucky man in whose barn a barn owl makes its head-quarters will have no need of any other mousekiller. The barn owl is fifteen to twenty inches long, yellowish brown marked with greyish white and black. His face is triangular, with a beak like a long nose. Sometimes he is called the monkey-faced owl. He does his work at night, when people and other daytime enemies of rats and mice are asleep. Quicker and more skilful even than a cat, he goes about his hunting. His soft feathers slip through the dark air without a whisper of sound, his big eyes see clearly where yours would see nothing at all, and his strong sharp claws and sharp curved beak catch and devour the dozens of little rodents that were looking for the crops in the field, the grain in the barn, or the little chickens asleep in their coops.

Owls eat without stopping to chew or to avoid swallowing indigestible parts of their game. After the night's hunting is over, their stomachs digest the good meat, make little balls of the fur and bones, and throw them up. You can tell when you find an owl's home, by the many round pellets of this sort scattered on the ground.

There are many kinds of owls. One of the commonest is the little screech owl, which is a little larger than a robin, though its thick soft feathers and large round head make it look much bigger. Some screech owls are grey, and some reddish-brown. They nest in hollow trees or neglected buildings. Their food is mostly mice and insects, with a few English sparrows. At night in summer—sometimes even in winter—you will hear their high quavering call, and with a little practice you can learn to imitate it so closely that the real owl will come swooping down near your hiding place, answering you and looking for the cousin he thinks you are.

A very large and fierce night bird is the great horned owl. (Of course his "horns" are really tufts of feathers.) You are not likely to see this owl, for he keeps in the dark shadows of trees if he ventures out of the thick woods. But you may hear his deep call of "Hoo-hoo hoo," very different from the high and fast quaver of the screech owl. The great horned owl sometimes eats chicken if he finds one out after dark, but if the chickens go to bed in their coops they are safe from him. Like his relatives, this owl eats many harmful creatures and can be looked upon as the farmer's friend.

Sometimes we have a visitor from the land of the Eskimo. The big snowy owl occasionally comes this far south during a cold winter. He is larger than the great horned owl and his white coat is spotted or barred somewhat with brown. He flies by day over the snow, catching mice and other animals. He is so rare and so big and beautiful that few hunters can resist the temptation to shoot. Year by year your chance of seeing a snowy owl is smaller.

JUNE WORK, Guide-lecturer

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FIELD MUSEUM OF NATURAL HISTORY

In Hall 21 are many hawks and owls, including those mentioned in the story. Perhaps you can see how all of them are especially fitted for the work they do.

STEPHEN C. SIMMS, *Director*

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MUSEUM STORIES FOR CHILDREN

SERIES IX
NUMBER SIX
NOVEMBER 10, 1928

FIELD MUSEUM OF NATURAL HISTORY
ROOSEVELT ROAD AND LAKE MICHIGAN
CHICAGO

MUSEUM STORIES FOR CHILDREN

SERIES IX

NUMBER SEVEN

NOVEMBER 17, 1928

FIELD MUSEUM OF NATURAL HISTORY

ROOSEVELT ROAD AND LAKE MICHIGAN
CHICAGO

FIELD MUSEUM OF NATURAL HISTORY

Rodents are animals whose strong front teeth are fitted for gnawing. In Hall 15 are many rodents, including beavers, porcupines, and the capybara. Some of them show you their teeth.

STEPHEN C. SIMMS, *Director*

GNAWERS.

Rabbits, squirrels, and mice belong to the large order of animals called rodents, or gnawers. All rodents are distinguished by their large, strong, front teeth. Probably the cleverest gnawer of all is the beaver, which cuts down trees with its teeth, and dams streams to make ponds in which beaver houses are built with their entrances under water.

The commonest rodent is probably the house mouse, which sometimes gnaws the corner of the pantry door, or makes a hole in the cracker box. The house mouse has learned to take advantage of the shelters people build, and doesn't have to worry about cold weather. His cousins the meadow mice don't seem to mind the cold much either, for in winter they have a house as big as the meadow in which they live. The roof and part of the walls are the hard crusted snow, in which the mice make tunnels all about, without coming up to the light. The food supply is largely the seeds of weeds, which are everywhere under the snow. The mice are sheltered from the storms, and hidden from most of their enemies during the time the snow is on the ground. At the west end of Hall 15 in Field Museum, you can see some mice as well as rabbits and other rodents.

Among the best known and prettiest rodents are the squirrels. The fox squirrel is the largest of these, and in the country he is often the commonest. During the autumn squirrels lead a busy life, preparing for winter. There are acorns and nuts to be gathered, and farmers are getting in their corn, many ears of which can be carried away by a watchful and clever squirrel. Much food is stored away in old woodpecker holes and other hollows, and much is eaten, for part of the preparation for cold times is to get as fat as possible. There is so much food that the squirrels grow reckless and wasteful, and you may find partly eaten nuts and pieces of kernels of corn among the acorn cups, nut husks, and corn cobs scattered under certain large trees in whose branches the squirrel feasts take place.

Another autumn task of the squirrels is the making of warm nests of leaves. Hollows in trees, woodpecker holes or rotted places enlarged by the squirrels, are favorite places, but they may make a nest of bunches of leaves among the branches, or roof over an old crow's nest, leaving only a door at one side. Here the squirrels sleep snugly in stormy weather, but when the winter sun is bright they come out to run about on bare branches, and to get food.

Gray squirrels live much the same life as fox squirrels in the country, but they are oftener found in the cities, living in parks, or even among buildings where there are trees. They have learned to look to man for part of their food, and seem to appreciate the cities' freedom from hawks, foxes, and human hunters. In Hall 15 are several different kinds of squirrels.

The muskrat, a little cousin of the beaver, is to be found where there are swamps, shallow ponds, or streams. Unlike the beaver, the muskrat cannot make his own pond by building a dam, but his way of life is something like the beaver's except that he does not mind living in settled country. The muskrat makes two kinds of dwelling. Beginning under water he digs a burrow into the bank, and brings the far end of it up above the water level, where he hollows out a cozy room and lines it with soft grass and moss. Using sticks, twigs, stalks of rushes and cattails, and the clay and sod from his digging, he also builds a little house in the water, with its entrance well below the surface and a room or two up above the surface of the water. When the winter ice covers the stream or pool, the muskrat never needs to come out into the open air, but swims about under the ice in search of roots to eat. He can hold his breath a long time, and when he must breathe he finds air between the water and the ice, especially near the banks. Near the east end of Hall 15 of Field Museum there is a muskrat family and house.

Not far from the muskrat group in Hall 15 is a woodchuck group. The woodchuck, or groundhog, is a rodent whose life is nearly always quiet and peaceful. Practically his only enemy, in a country where there are no foxes, is the dog, to which he is a fat and tempting prey. When cornered the woodchuck can fight fiercely, or climb a tree, where he looks ridiculously heavy and out of place. But oftenest when hunted he goes deep down into his burrow, and either escapes from one of the several doors while the dogs are digging at another or else digs down so deep and fast that they cannot catch him. Most of his time is spent sleeping and eating, and during the summer he gets very fat. When winter comes he goes down into his hole and goes to sleep. All winter long he sleeps, and the food stored in his body as fat keeps him from getting hungry until the spring sun wakes him from this hibernating sleep, and he comes forth, lean, to begin the summer work of getting fat again.

JUNE WORK, Guide-lecturer

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MUSEUM STORIES FOR CHILDREN

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FIELD MUSEUM OF NATURAL HISTORY
ROOSEVELT ROAD AND LAKE MICHIGAN
CHICAGO

FIELD MUSEUM OF NATURAL HISTORY

At the west of William V. Kelly Hall (Hall 17) are exhibits showing the complete life history of the tomato worm or hawk moth, as well as illustrations of some of Nature's own methods of getting rid of destructive insects by means of parasites.

STEPHEN C. SIMMS, *Director*

AN INTERESTING ENEMY

What is more fun than spading the ground, preparatory to making a garden? Whether we are working it loose to catch and hold the winter's snow or spading in the fertilizing material that it may become disintegrated by spring, we are sure to uncover one or more of the odd creatures that lurk within the closely-matted roots near the surface or in the cool, damp soil below.

Some are friends to the garden; many more are enemies. Some are so small they entirely escape our notice, and others are so well camouflaged that they resemble the dirt and refuse in which they lie. Only the keenest of observers will be able to discover their hiding places.

If you happen to see a queer, smooth, mahogany-brown jug, from one and a half to two and a half inches long and having a slender handle that bends backwards, be sure to destroy it at once. In that leathery case lies the larva of a "Tomato-worm Moth," one of the worst enemies a garden can possibly have.

Perhaps you have noticed just at dusk, during the late summer evenings, a large, robust, gray and brown moth with orange spots along the sides of the body. It appeared to hover like a humming-bird above the beds of lilies or petunias. Most people will tell you it is a "Hawk-moth." It is so called from its habit of darting suddenly downward when approached and never seeming to alight. With the aid of powerful muscles in its narrow, pointed wings it poises above the deep-throated blossoms and feasts upon the nectar secreted at the bottom of the deep tubes. The tongue or "sucking-proboscis" is four inches long, and when not in use rests, coiled up like a watch-spring, on the under side of the head.

As a winged insect this beautiful creature is absolutely harmless and thrills us with its ceaseless industry. But just watch a mother Hawk-moth for a time.

She has other plans than merely feeding. When she has found a good, healthy leaf on your tomato or potato plants she deposits one or two—never more—globular, leaf-green eggs on the under side. A few days later she dies, but her work is not ended.

About a week later, the eggs hatch into tiny gray caterpillars or larvae. The most noticeable feature will be a slender, curved horn on the last segment of the body. At first the larva eats only little holes in the luscious leaf, but as it develops and its appetite increases it devours every particle except the midrib. If leaves are scarce, it will feed upon both the green and ripe tomatoes.

The caterpillar sleeps during the bright daylight. If you would rid your garden of this pest hunt him in the early dusk, at night or early in the morning. For twenty-two days he will feast. During that period he moults four times and changes in color until he becomes a light bluish green. When fully grown he measures four and a quarter inches long and is as large around as a finger. The feet are barred with black and white, the horn is dark and sharp and there are oblique white lines on the sides of the body. Many weird tales have been written about the poisonous effects of that horn. It is absolutely harmless as far as human beings are concerned.

If disturbed while feeding, the caterpillar jerks furiously, making a slight squeaking noise. At rest, it elevates the front part of the body and curls the head under a little. This forms an attitude which some have likened to the Sphinx. Hence the scientific name of the group of moths whose larvae are similar.

After the fourth moult, all feeding ceases. The color becomes duller and the caterpillar crawls restlessly about seeking soft ground in which to pupate. The desired location found, it digs its way down at least two inches into the soft earth and remains quiet for two weeks.

Then the caterpillar wriggles out of its caterpillar-skin and appears as an entirely different creature. At first, it is soft, pulpy and green. Its abdomen is greatly stretched out and its eyes are very prominent. At the end of the body projects a double, broad, flat tube. Gradually the body contracts into shape. The tongue case grows slender, curved and hard. At the end of the two-hour process, the pupa rests secure within a stiff, leathery, brown jug.

In the ground, during the long winter months, a most marvelous and mysterious change takes place. Unless you are fortunate enough to find the pupa cases and destroy them, the warm days of spring will find an adult moth cutting its way through the enclosing walls and forcing its way to the surface.

Then the whole cycle of life begins again and some one will lose his best tomatoes, for these great, green caterpillars must reproduce others of the same kind.

MARGARET M. CORNELL, Guide-lecturer

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FIELD MUSEUM OF NATURAL HISTORY

ROOSEVELT ROAD AND LAKE MICHIGAN
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FIELD MUSEUM OF NATURAL HISTORY

In Hall 20 is a large case showing the sort of place in which gulls rear their young. In Hall 21 you can find herring gulls and many other gulls. Notice their strong wings, their webbed feet for swimming, and their sharp and powerful beaks.

STEPHEN C. SIMMS, *Director*

THE HERRING GULL

At this time of year there are few birds easier to find in Chicago than the herring gull, often called the sea gull. Herring gulls are common in the northern hemisphere all the way around the world, wherever there is water. Their long, strong wings often carry them many miles inland, but though you may see them flying high over cities and fields, you will not often see one alight, except near water.

Gulls eat many kinds of food. Much of it consists of dead fish, cast up on shore by waves or left behind by the tide. Sometimes you may see a group of gulls flying rather low over the water, watching it closely. Suddenly one of them swoops, perhaps going completely under the water, and coming up with a fish in its beak. Fishermen's boats are followed by flocks of gulls, eager for waste thrown overboard when the fish are cleaned. Along the shore fishermen wind their big nets on great reels to dry in the sun and wind. Gulls perch on the reels to examine the nets mesh by mesh for any scraps that may have stuck to them. In Hall 20 of Field Museum is a case showing several herring gulls as they appear on the ice of Lake Michigan in winter. They are shown about to eat a fish. Another form of food is shellfish. When the shells of these are too hard to be cracked with the bird's beaks, gulls fly with them high in the air, and drop them on a rock to break them. Crabs and other sea animals are also eaten. At times gulls eat dead animals found on the land. They also eat many insects. Herring gulls and other species of gulls, as the Franklin's gull, are sometimes seen following a plow across a field, to pick up the worms and grubs it uncovers.

Cities that stand on the shores of a lake or ocean, as Chicago does, often dump garbage and other waste in the water off shore. This supplies the gulls with much food, and they unintentionally make themselves useful by cleaning up the waste. Ships near coast are seldom without a following of gulls watching hopefully for food scraps thrown overboard. They often follow ships for many miles out to sea, and are believed on rare occasions to fly all the way across the Atlantic.

Have you ever watched gulls flying? Their wings are long, slender, and strong, and the birds waste no energy in using them. Often you will see one fly steadily for many minutes without a single flap. Only, occasionally, you will see it shift the position of its wings or tail just a little. Those of you who have made airplane models know how a lift or drop of the tip of a wing or a tiny shift of the rudder changes the course of a flying thing. The gull's tail is its rudder. It can fly easily, even almost directly against the wind. Even gulls must rest sometimes, and when they are tired they sit on the water, floating lightly and comfortably, while they sleep. The thick, oiled feathers keep them warm.

From September to May there are great flocks of gulls in Chicago. They gather along the beaches, on the piers and breakwaters, and in the park lagoons. If you are walking in Lincoln Park or Jackson Park in the winter you can tell when you are near water by the clamor and creaking cries of gulls. Then suddenly, with the coming of warm weather, there are only a few of them to be seen about the city. They have gone to their nesting places. Herring gulls nest on islands in the northern parts of Lake Michigan and the other great lakes, and along the coasts of the Atlantic and Pacific oceans north from Maine and British Colombia. The nests are usually crude masses of leaves and plant stalks, which the mother molds with her breast. They are ordinarily made on rocks or gravel, or even on ice. Sometimes, where people gather the eggs to eat, the birds make their nests in trees. They prefer to nest in large colonies.

Three grayish or brown speckled eggs are laid, and for about four weeks the mother sits brooding, while the father stays near her, and probably helps with the brooding at times. When the young hatch, covered with yellowish down speckled with black, the parents take good care of them. At first they not only feed the young, but watch them carefully, to chase off enemies and cover the babies from rain and too hot sun. When the parents feed the little ones they first swallow the food, and then bring it up and let the little ones take it from their beaks. As the young grow older the parents put this regurgitated (un-swallowed) food on the ground and let the little ones pick it up.

The young gulls grow fast, and in five or six weeks they have their feathers. As they grow older and stronger they learn to fly, and in September they begin to appear in our part of the world, with their parents. We can easily tell the young birds when we see them, for though they are full grown and can fly skillfully, they still wear the spotted or mottled plumage of the young. And although they are old enough to take care of themselves we sometimes see them taking food away from the older birds. It is about three years before the young acquire the complete white coat, with blue-gray wings tipped with black and white, of the fully matured herring gulls. Gulls seem to live a long time, perhaps as much as twenty-five or thirty years.

JUNE WORK, Guide-lecturer

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